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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,273	07/31/2003	Warren M. Farnworth	MI22- 2379	5475

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EXAMINER

KOBER, RUSSELL MARC

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,273	FARNWORTH ET AL.	
	Examiner	Art Unit	
	Russell M. Kobert	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-47 and 49-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-33, 36-39, 41, 45-47 and 50-59 is/are rejected.
- 7) ☒ Claim(s) 34, 35, 40, 42-44 and 49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 October 2005 and 31 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0106</u> | 6) <input type="checkbox"/> Other: _____ |

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1. Upon reconsideration of the claimed invention, prosecution is hereby reopen and the prior allowance is hereby withdrawn.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the intermediate structure between the projection and the substrate, as described in claims 55, 56 and 59, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Claims 55-57 and 59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitations in claims 55, 56 and 59 of "an intermediate structure between the projection and the substrate" raises new matter because it was never originally disclosed in the specification including the claims as originally filed.

4. Claims 55-57 and 59 are objected to because of the following informalities: It is not understood how an intermediate structure can be positioned between the projection and the substrate since the projection comprises material of the substrate? Moreover, to do so would result in physical discontinuity between the projection and the substrate that is contradictory to having the projection comprising material of the substrate. Appropriate correction is required.

5. Applicants are reminded that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

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The following is a recitation of MPEP 2111.04 that states that claim scope is not limited by claim language that does not limit a claim to a particular structure (note "structure"):

MPEP 2111.04 [R-3] "Adapted to," "Adapted for," "Wherein," and "Whereby" Clauses

Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure. However, examples of claim language, although not exhaustive, that may raise a question as to the limiting effect of the language in a claim are:

- (A) "adapted to" or "adapted for" clauses;
- (B) "wherein" clauses; and
- (C) "whereby" clauses.

6. In order to emphasize claim language not considered furthering limiting the claimed invention, such limitations have been *italicized* in this Office Action.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 31-33, 36-39, 41, 45, 46, 50-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Leedy (5323035).

Leedy anticipates (Figure 2) an engagement probe comprising:

A substrate (that portion of 14 having its elevation above the level plane of item 12);

A projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate; and

A grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another *to collectively engage a single conductive pad on a semiconductor substrate* (col 5, ln 39-40); and

Wherein the projection comprises a lateral dimension less than a lateral dimension of the substrate (note portions of 14 as noted supra and drawn in Figure 2 meet this limitation); as recited in claim 31.

As to claim 32 the added limitation of comprising a plurality of such groupings *for engaging multiple conductive pads on the semiconductor substrate* (reference made to use of a plurality of insertion structures to make temporary and reliable electrical interconnection to the signal, power and ground contacts of an IC; see col 1, ln 20-31) is anticipated.

As to claim 33 the added limitation of the apexes being in the shape of multiple knife-edge lines is anticipated (having the apexes in this configuration is inherent to the teaching of Leedy because Leedy teach that its insertion structures can be configured in a plurality of arrangements further exemplified by its disclosed embodiments; in Figure 2, each insertion structure can be made with a "blade-like edge" as noted at col 4, ln 22-25).

As to claim 36 the added limitation of the grouping of apexes being formed on the projection that is supported by another projection (either 40 or 42 or both in combination), the another projection extending directly from the substrate is anticipated by Leedy (note this projection is positioned directly from substrate 14).

As to claim 37 the added limitation of the apexes having a selected projecting distance, *the projecting distance being about one-half the thickness of the conductive pad which the apparatus is adapted to engage* has no effect on the physical and dimensional aspects of the claimed invention that is limited to only an engagement probe and therefore does not further limit the claimed invention according to claim 31.

As to claim 38 the added limitation of the apexes projecting from a common plane (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane).

As to claim 39 the added limitation of the apexes projecting from a common plane (the upper horizontal border of layer 20) of the projection, the apexes having respective tips and bases of adjacent projecting apexes and being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane), *the*

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tips being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage (the italicized features have no effect on the physical and dimensional aspects of the claimed invention that is limited to only an engagement probe and therefore does not further limit the claimed invention according to claim 31).

As to claim 41 the added limitation of the conductive apexes constitute a first electrically conductive material (20), and *wherein the conductive pads for which the probe is adapted have outermost portions constituting a second electrically conductive material; the first and second electrically conductive materials being different* is anticipated (multiple choices of conductive materials are disclosed by Leedy [col 3, ln 25-29] and further note reference to dissimilar metals at col 3, ln 40-46).

As to claim 45 the added limitation of the plurality of projecting apexes extending from a substantially planar uppermost surface (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection is anticipated.

As to claim 46 having an entirety of the projection spaced from the substrate is anticipated by Leedy (that portion of 14 having its elevation below the level plane of item 12).

Leedy anticipates (Figure 2) an engagement probe comprising:

a substrate (that portion of 14 having its elevation above the level plane of item 12);

a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate;

a grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another *to collectively engage a single conductive pad on a semiconductor substrate* (col 5, ln 39-40); and

wherein the grouping of apexes is formed on the projection which is supported by another projection (either 40 or 42 or both in combination), the another projection extending directly from the substrate (note this projection is positioned directly from substrate 14); as recited in claim 50.

Leedy anticipates (Figure 2) an engagement probe comprising:

a substrate (that portion of 14 having its elevation above the level plane of item 12);

a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate;

a grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another *to collectively engage a single conductive pad on a semiconductor substrate* (col 5, ln 39-40); and

wherein the apexes project from a common plane (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting

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its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane); as recited in claim 51.

Leedy anticipates (Figure 2) an engagement probe comprising:

a substrate (that portion of 14 having its elevation above the level plane of item 12);

a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate;

a grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another *to collectively engage a single conductive pad on a semiconductor substrate* (col 5, ln 39-40); and

wherein the apexes project from a common plane (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane), *the tips being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage* (the italicized features have no effect on the physical and dimensional aspects of the claimed invention that is limited to only an engagement probe and therefore does not further limit the claimed invention according to claim 31); as recited in claim 52.

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Leedy anticipates (Figure 2) an engagement probe comprising:

A substrate (that portion of 14 having its elevation above the level plane of item 12);

A projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate; and

A grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another *to collectively engage a single conductive pad on a semiconductor substrate* (col 5, ln 39-40);

Wherein an entirety of the projection is spaced from the substrate (that portion of 14 having its elevation below the level plane of item 12); as recited in claim 53.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leedy (5323035) as applied to claim 31 above, and further in view of Liu et al (5177439).

Although Leedy does not specifically teach the substrate comprises bulk silicon;

Liu et al teach the substrate comprises silicon (col 3, ln 44-50); as described in claim 47.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teaching of Liu et al with that of Leedy to make the claimed invention because each teach the use of insertion structures for electrically contacting pads of a semiconductor device and one having ordinary skill in the art would have been motivated to combine the teaching of Liu et al with that of Leedy because Liu et al teach that the primary advantage of building the probe card from material similar to the integrated circuit is that the coefficients of thermal expansion will match making the probe card particularly suited for burn-in testing (col 2, ln 53-60 and col 7, ln 2-5). As to the substrate comprising bulk silicon, it is considered an old and well known industry practice to make substrates for wafers and the like out of bulk silicon material.

12. Claims 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leedy (5323035) in view of Liu et al (5177439).

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Leedy teach an engagement probe comprising:

A substrate (that portion of 14 having its elevation above the level plane of item 12);

a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate;

a grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another to collectively engage a single conductive pad on a semiconductor substrate (col 5, ln 39-40); as described in claim 54.

Although Leedy does not specifically teach the substrate comprises bulk silicon;

Liu et al teach the substrate comprises silicon (col 3, ln 44-50); as described in claim 54.

As to claim 58 the additional limitation of the projecting apexes comprising silicon is taught by Liu et al (with reference to Figures 2 and 4, material 10 is part of the supporting substrate and is also part of the probe tip 11 and material 10 is made of silicon; see also col 3, ln 44-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teaching of Liu et al with that of Leedy to make the claimed invention because each teach the use of insertion structures for electrically contacting pads of a semiconductor device and one having ordinary skill in the art would have been motivated to combine the teaching of Liu et al with that of Leedy because Liu et al teach that the primary advantage of building the probe card from material similar to the integrated circuit is that the coefficients of thermal expansion

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will match making the probe card particularly suited for burn-in testing (col 2, ln 53-60 and col 7, ln 2-5). As to the substrate comprising bulk silicon, it is considered an old and well known industry practice to make substrates for wafers and the like out of bulk silicon material.

13. The following is a statement of reasons for the indication of allowable subject matter:

Claims 34, 35, 40, 42-44 and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The added limitation of the apexes in the shape of knife-edge lines wherein the multiple knife-edge lines are positioned to form at least one polygon as detailed in claim 34 has not been found.

The added limitation of the apexes in the shape of multiple knife-edge lines wherein the multiple knife-edge lines are positioned to form at least two polygons one of which is received entirely within the other as detailed in claim 35 has not been found.

The added limitation of the apexes in the shape of multiple knife-edge lines wherein the multiple knife-edge lines are interconnecting to form at least one fully enclosed polygon as detailed in claim 40 has not been found.

The added limitation of multiple knife-edge lines either interconnecting or being positioned to form at least one polygon as mentioned in claims 42 and 44 have not been found..

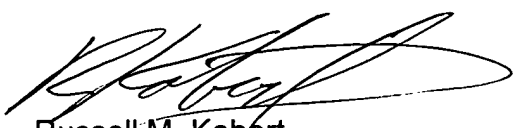
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The added limitation of the apexes in the shape of multiple knife-edge lines wherein the multiple knife-edge lines are positioned to form at least two polygons one of which is received entirely within the other as detailed in claims 43 and 49 have not been found.


14. A shortened statutory period for response to this action is set to expire three month(s) from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kobert whose telephone number is (571) 272-1963. For an automated menu of Tech Center 2800 phone numbers call (571) 272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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May 4, 2006



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